



Article

Opening the “Black Box” of University Entrepreneurial Intention in the Era of the COVID-19 Pandemic

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Abstract: This research aims to study the determinants of entrepreneurial intention in academia and compare the outcomes from two different moments, before and during the COVID-19 pandemic. For this purpose, a quantitative methodology was used, whereby a questionnaire was given to higher education students in these two chronological moments. From the obtained results, it was possible to ascertain that, given the motivational dimension, the attitude towards behavior and perceived behavioral control are having a positive impact on entrepreneurial intentions during the pandemic and that subjective norms have a negative impact on entrepreneurial intentions. This relationship of influences is unchanged, either before or during the pandemic. Regarding the environmental dimension, both of the variables under analysis are having a negative impact on entrepreneurial intention during the pandemic period, which corresponds to an aggravation or loss of positive influences when compared to the context before the pandemic, and the next assessment had a positive impact on entrepreneurial intentions. On the theoretical contributions, the findings are very important, as they strengthen the literature on entrepreneurial intentions, and in specific contexts of social and economic instability. As for practical contributions, this research suggests actions to agents with an important intervention role in the community, one of these agents is Higher Education Institutions, which play a determining role by creating a positive environment to support their students' entrepreneurial intent. This research is original, as far as we are informed, and it is the first to study entrepreneurial intention in academia during the COVID-19 pandemic in the Portuguese context. Moreover, we suggest that the obtained results should be succeeded by further studies to confirm the evolutionary trends now identified on the subject under analysis.

Keywords: university; entrepreneurial intention; academy; third mission of the university; pandemic; COVID-19; Portugal



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1. Introduction

Over the past few decades, entrepreneurship has been considered by the international community and scholars as being of vital importance for regional development (Hernández-Sánchez et al. 2020; Lopes et al. 2018). Thus, entrepreneurship is widely accepted as a determining factor and driver of social and economic development, improving the well-being of societies, and increasing and promoting the creation of value and wealth (Audretsch et al. 2015; Fayolle et al. 2016; Lopes et al. 2021). However, the research

obtainability may be adverse during uncertain times, such as the COVID-19 pandemic, which is very scarce (Branzei and Abdelnour 2010; Hernández-Sánchez et al. 2020).

During the current global crisis, caused by the COVID-19 pandemic, governments have had to take firm measures, many of them based in contexts of various confinements or lockdowns and social distancing all over the world. The lack of effective treatments or vaccines to handle the COVID-19 pandemic has prompted governments to make these decisions to reduce the spread of the pandemic amongst the population (Ignat and Constantin 2020; Kaur and Gupta 2020). These measures have created a new context, not properly documented in the scientific literature about entrepreneurship (Bonaccorsi et al. 2020; Kuckertz et al. 2020).

Despite these circumstances, several entrepreneurs have managed to shape their businesses and innovate, and others have even managed to convert a threat into an important opportunity for their business (Ratten 2020). On the negative side, many entrepreneurs have been forced to close their companies temporarily to meet the restrictions imposed by governments. Some companies were able to remain open, however, they had to work in limited forms (Ignat and Constantin 2020). Nevertheless, some companies had to close definitely because they were unable to support aggravated expenses. Regarding entrepreneurial intention, it has decreased due to the current unfavorable situation of uncertainty, which instigated a negative impact on the development of entrepreneurial intention (Ruiz-Rosa et al. 2020).

As entrepreneurship is one of the main drivers of economic growth, it is estimated that around 99.8% of the total number of companies in the European Union are medium, small, and micro companies that employ around 66% of the active working population, creating around 57% of the added value of the entire European Union economy (Bigos and Michalik 2020). The COVID-19 pandemic highlighted the need to support academic entrepreneurship, which is constantly facing new challenges, namely in the development and identification of essential attitudes and skills for future entrepreneurs and managers (McKellar 2020; Wilson 2013). On the other hand, unemployment amongst young people remains very high, despite being urged to reduce this trend. Thus, actions that provide increased self-employment among these youngsters should be proactively supported through broadly defined inclusive actions (Bigos and Michalik 2020; Georgescu and Herman 2020).

In recent years, entrepreneurship education has been extensively investigated (Kisubi et al. 2021; Lopes et al. 2020a, 2020b; Maula and Stam 2019; Alnasser et al. 2021; Nguyen and Duong 2021; Aljaaidi and Waddah 2021; Wei et al. 2019); however, with the constant changes in the market, it became necessary to develop studies that meet the expectations of the market within new conjectures such as the COVID-19 pandemic (Bigos and Michalik 2020; Hernández-Sánchez et al. 2020).

In this context, the present research's main objective is to study the determinants of entrepreneurial intention in the academy and compare the outcome from two moments, before and during the COVID-19 pandemic. This research is original, from our knowledge, and it is the first to study entrepreneurial intention in academia during the COVID-19 pandemic in the Portuguese context.

With this study, we were able to verify that, given the motivational dimension, the attitude towards behavior and perceived behavioral control are having a positive impact on entrepreneurial intentions during the COVID-19 pandemic and that subjective norms have a negative impact on these intentions. This relationship of influences vis-à-vis the entrepreneurial intention is unchanged, whether we analyze the period before or during the COVID-19 pandemic. Regarding the environmental dimension, both of the variables under analysis are having a negative impact on entrepreneurial intention during the pandemic period, which corresponds to an aggravation or loss of positive influences when compared to the context before the pandemic. The next assessment had a positive impact on entrepreneurial intentions.

This research starts with the present introduction, which identifies the problems related to the theme under study. In the second part, an extensive literature review on

entrepreneurial intention in the academy is performed, focused on times of crisis and pandemics. In Section 3, the methodology used is detailed, as well as a description of the entire data collection process. In Section 4, the results are revealed, discussed, and compared to the literature. Finally, conclusions are presented together with theoretical and practical contributions as well as clues for future investigations.

2. Literature Review

2.1. University Third Mission

Scientific studies divulge that there are significant differences between the levels of attitudes and entrepreneurial intention of students who participate in programs for entrepreneurship and those who do not (Fayolle and Liñán 2014). However, the relationship between some educational variables (selection of participants, course content, teaching methods, professional profile of teachers, resource assessment, etc.) and the impact of programs for entrepreneurship on entrepreneurial intentions and/or behavior (attitudes, values, competencies, etc.) of students has not been studied much (Fayolle and Gailly 2015).

According to Guerrero and Peña-Legazkue (2013), many studies confirm that entrepreneurial universities effectively encourage regional economic development by attracting several complementary stakeholders, including researchers dedicated to the development and commercialization of new technologies, and support entrepreneurial communities integrated into the business scenario where universities are embedded.

We can say that, traditionally, universities were only focused on two missions (research and teaching). However, over time, there was a need for many academics to participate and be involved in entrepreneurial activities (Etzkowitz 1998), which are considered the “third mission” of universities (Lopes et al. 2020a, 2020b).

Through its third entrepreneurial mission, academia may also nurture opportunities to launch partnerships, thereby helping regions to generate wealth and become more competitive (Lopes et al. 2020a, 2020b). It is important to understand the role played by regional and national stakeholders, as well as the existing barriers to entrepreneurial initiatives and the means to overcome them within the context of the entrepreneurial academy (Davey et al. 2015). Consequently, researching university entrepreneurship is fundamental given its extreme importance to the economic development and growth of countries/regions (Lopes et al. 2020a, 2020b).

2.2. Entrepreneurial Intentions

Since entrepreneurship is considered a priority by several governments and is associated with improving innovation, increasing productivity, employment prospects, and economic gains, it is imperative to investigate the factors that can affect entrepreneurial intentions, aiming to develop and apply effective policies (Farrukh et al. 2017, 2018).

The intention can be understood as a conscious, deliberate, and planned state of mind that precedes the action and that allows direct attention to certain behaviors, such as the creation of a company (Esfandiar et al. 2019). In the context of entrepreneurship, entrepreneurial intention can be considered as a “self-recognized conviction” by any individual willing to start a new entrepreneurial enterprise. Thus, becoming a key element to understand the process of creating new companies (Farrukh et al. 2018; Liñán et al. 2011; Ridha et al. 2017). Entrepreneurial intention can be also considered as a state of mind that leads an individual to choose their job instead of working for other people (Karimi et al. 2016).

2.2.1. Motivational Factors

Amongst the models of intention/behavior, the most investigated is the Theory of Planned Behavior (TPB), which has been widely applied to research on entrepreneurship and whose effectiveness and ability to predict entrepreneurial intention has already been demonstrated in several studies on entrepreneurship (Karimi et al. 2016).

The model created by [Ajzen \(1991\)](#) explains how the cultural and social environment affects human behavior. According to this theory, an individual's intentions result from three determinants, which we can consider as the following motivational factors: attitude towards the behavior, perceived behavior control, and subjective norms. Attitude towards the behavior refers to the attractiveness of the proposed behavior for which the individual has a positive or negative personal assessment of being an entrepreneur ([Ajzen 1991](#); [Liñán et al. 2011](#)).

Several studies ([Fayolle et al. 2014](#); [Liñán et al. 2011](#); [Martínez-González et al. 2019](#); [Ruiz-Rosa et al. 2020](#)) have found a positive relationship between the attitude towards the behavior and the individual's entrepreneurial intention.

Perceived behavior control refers to the easiness or difficulty that an individual feels in becoming an entrepreneur ([Ajzen 1991](#)). It translates into the greater or lesser difficulty that a person feels when acting with the ability to control their behavior ([Ruiz-Rosa et al. 2020](#)). This variable can be influenced by different processes, such as enactive mastery, role modeling, social persuasion, and judgments ([Liñán et al. 2011](#)). [Ajzen \(2002\)](#) suggests that this is a broad concept that covers self-efficacy and the perceived controllability of behavior.

Some studies ([Krueger et al. 2000](#); [Ruiz-Rosa et al. 2020](#); [Smith and Woodworth 2012](#)) have recognized that the self-perception of the personal ability to perform a certain action significantly influences the intention to perform that action, which can be translated into a positive relationship between the perceived behavioral control and the individual's entrepreneurial intention.

On the other hand, subjective norms measure the social pressure perceived by family, friends, and other important people ([Ajzen 1991](#)), and refers to the perception that "reference persons" may or may not approve the individual's decision to become an entrepreneur ([Ajzen 2002](#)). Since subjective norms refer to the perception of social pressure to perform, or not, a certain behavior, these become the main reflection of social and cultural values ([Ruiz-Rosa et al. 2020](#)).

Although some studies have not found a significant relationship between subjective norms and the entrepreneurial intention of individuals ([Autio et al. 2001](#); [Krueger et al. 2000](#)), some authors consider that it is reasonable to expect a positive relationship between this variable and entrepreneurial intent since they consider that entrepreneurs are affected by the opinions of people linked to their closest environment, in relation to their entrepreneurial intentions ([Ruiz-Rosa et al. 2020](#); [Tiwari et al. 2017](#)).

The TPB model has been successfully applied by several investigators ([Iakovleva et al. 2011](#); [Karimi et al. 2013](#); [Liguori et al. 2018](#); [Martínez-González et al. 2019](#)) who studied the relationship between these motivational factors and the entrepreneurial intention of students, concluding that these determinants have a strong impact on their entrepreneurial intention. Although this relationship is confirmed for both students studying in developed countries and students studying in developing countries, the degree and importance of the determinants may vary according to the conditions and the country in which they are studying ([Farrukh et al. 2018](#)).

2.2.2. Environmental Factors

According to the Social Learning Theory, environmental factors have a great influence over learning and higher cognitive processes ([Bandura et al. 1999](#)). In this way, environmental factors can play a role in shaping entrepreneurial intentions ([Liñán et al. 2011](#)).

Individuals are influenced by closer valuations (next assessment) and this contributes to the generation of more favorable perceptions for the creation of new companies ([Kim et al. 2006](#); [Liñán et al. 2011](#)). [Liñán et al. \(2011\)](#) considered that the expectations of family, friends, and important people will influence students' responses to their entrepreneurial intent.

Social valuation (social assessment) also plays a critical role in determining entrepreneurial behavior, since the values of specific groups or societies shape the develop-

ment of certain skills and personality traits, which will influence the way individuals view entrepreneurship (Liñán et al. 2011; Thomas and Mueller 2000).

2.3. Entrepreneurship during the COVID-19 Pandemic

According to the approach of social-cognitive theory (Bandura 1986), the surrounding environment influences the behavior of an individual through personal perceptions. Thus, some authors have argued that entrepreneurial intention is conditioned, in addition to individual motivations, by the conditions of the economic context in which individuals find themselves (Devece et al. 2016; Hundt and Sternberg 2014).

Knowing that the promotion of entrepreneurship can be an important measure to respond to situations of economic crisis (Capella-Peris et al. 2019), Maritz et al. (2020) recognized that, in the actual circumstances caused by the COVID-19 pandemic, entrepreneurs will be key factors in the creation of new businesses, with a focus on identifying opportunities, to stimulate economic activity.

Other studies (Arrighetti et al. 2016; Devece et al. 2016; Hundt and Sternberg 2014) have demonstrated that in times of economic crisis, the rate of entrepreneurship decreases considerably and affects negatively entrepreneurial intent. Nonetheless, Kuckertz et al. (2020) suggested that, as entrepreneurs are used to dealing with uncertainty and failure, they can demonstrate flexibility and adapt their business models to the new situations caused by the pandemic crisis COVID-19.

As an entrepreneur's ability to respond to crises is determined by factors such as entrepreneurial culture and diversity of knowledge (Bishop 2018), it is important to adopt consistent policies to foster entrepreneurship (Kuckertz et al. 2020), assuming the universities adopt a preponderant role in this context.

Taking into consideration all of these relevant aspects of the impact of the COVID-19 pandemic, we have formulated an investigation model (Figure 1) to explain the flow of our research and the hypothesis formulation.

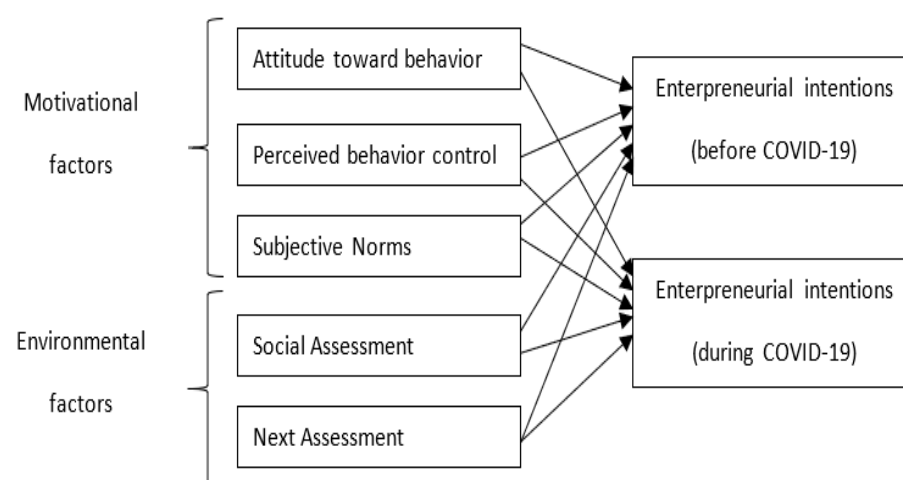


Figure 1. Investigation model.

Succeeding the investigation model, we have formulated the following hypotheses, based on the relevant literature described in Table 1 below:

Table 1. Relevant literature for the formulation of hypotheses. (* refers authors who provide theoretical contributions to the hypotheses under study).

	H1A	H1B	H2A	H2B	H3A	H3B	H4A	H4B	H5A	H5B
(Farrukh et al. 2018)	*		*		*					
(Liñán et al. 2011)	*		*		*		*		*	
(Karimi et al. 2016)	*		*		*					
(Fayolle et al. 2014)	*									
(Martínez-González et al. 2019)	*									
(Ruiz-Rosa et al. 2020)	*		*		*					
(Kuckertz et al. 2020)		*	*	*		*		*		*
(Smith and Woodworth 2012)			*							
(Tiwari et al. 2017)					*					
(Kim et al. 2006)							*			
(Thomas and Mueller 2000)									*	
(Maritz et al. 2020)		*		*		*		*		*

Hypothesis 1A (H1A). *Attitude towards behavior has a positive impact before the pandemic on entrepreneurial intentions.*

Hypothesis 1B (H1B). *Attitude towards behavior has a positive impact during the pandemic on entrepreneurial intentions.*

Hypothesis 2A (H2A). *Perceived behavioral control has a positive impact before the pandemic on entrepreneurial intentions.*

Hypothesis 2B (H2B). *Perceived behavioral control has a positive impact during the pandemic on entrepreneurial intentions.*

Hypothesis 3A (H3A). *Subjective norms have a positive impact before the pandemic on entrepreneurial intentions.*

Hypothesis 3B (H3B). *Subjective norms have a positive impact during the pandemic on entrepreneurial intentions.*

Hypothesis 4A (H4A). *Social assessment has a positive impact before the pandemic on entrepreneurial intentions.*

Hypothesis 4B (H4B). *Social assessment has a positive impact during the pandemic on entrepreneurial intentions.*

Hypothesis 5A (H5A). *The next assessment has a positive impact before the pandemic on entrepreneurial intentions.*

Hypothesis 5B (H5B). *The next assessment has a positive impact during the pandemic on entrepreneurial intentions.*

3. Methodology and Data Collection

The present research uses a quantitative methodology. A quantitative methodology is the most used in studies carried out on entrepreneurship (Hlady-Rispal and Jouison-Laffitte 2014) as the samples of collected data allow for the validation of theories and relationships between the collected variables. There is also the advantage of allowing the results to be

generalized, making it possible to replicate the results with different samples. According to a study by [Hlady-Rispa and Jouison-Laffitte \(2014\)](#), between 2007 and 2011, 111 articles on entrepreneurship were published in international magazines that used a quantitative methodology. Furthermore, it is also possible to mention recently published authors on the subject, such as [Kisubi et al. \(2021\)](#), [Maula and Stam \(2019\)](#), [Alnasser et al. \(2021\)](#), [Nguyen and Duong \(2021\)](#), and [Aljaaidi and Waddah \(2021\)](#).

The data used in this study result from a questionnaire given to higher education students, previously applied by [Liñán et al. \(2011\)](#) and [Lopes et al. \(2020a, 2020b\)](#), and collected at different times. Sample 1 contains 596 valid responses that were collected before the pandemic (between April 2017 and October 2019) and sample 2 contains 518 valid responses that were collected during the COVID-19 pandemic (between June and December 2020).

The applied questionnaire contained three major groups of questions that collected the following: (1) the sociodemographic characteristics of the respondents; (2) the propensity for entrepreneurial activity—Group of questions, A; and (3) the perception of the values that society places on entrepreneurship—Group of questions, C. All of the questions have an associated Likert scale of seven points, except for the questions relating to sociodemographic conditions. The questions related to groups A and C use an agreement scale, ranging from 1—strongly disagree to 7—strongly agree.

In both samples, the application of the questionnaire to higher education students followed the same procedure. The results from questions related to sociodemographic characteristics were collected to make a general characterization of the respondents in the samples (Table 2). The results were obtained through the use of SPSS software.

Table 2. Sociodemographic characteristics.

		Sample 1	Sample 2
Observations (N)		596	518
Age (years)	Minimum	18	17
	Maximum	68	60
	Average	29.40	23.30
Gender	Male	38.30%	29.90%
	Female	61.70%	70.10%
Residence	Portugal Mainland	69.79%	84.50%
	Azores	14.80%	0.34%
	Madeira	12.80%	0.67%
Education level	Undergraduate	55.00%	71.30%
	Master	31.70%	10.90%
	Doctorate	5.50%	0.70%
	Other	7.80%	17.10%
Job experience	Yes	72.50%	64.70%
	No	27.50%	35.30%
Self-Employed or SME Owner	Yes	13.30%	7.10%
	No	86.70%	92.90%

In both samples (1 and 2), the gender of the participants is mostly female (61.7% and 70.1% in sample 1 and 2, respectively), with the average age of respondents falling below 30 years (29.4 years in sample 1 and 23.3 years in sample 2). Respondents are almost entirely residents of Portugal (97.4% and 99.7% in sample 1 and 2, respectively). Most respondents are studying or already have an undergraduate degree (55% in sample 1 and 71.3% in sample 2) and have already had job experience (72.5% in sample 1 and 64.7% in sample 2),

although only a small percentage have been autonomous or own a small or medium-sized company (13.3% in sample 1 and 7.1% in sample 2).

According to the results found by Liñán et al. (2011) and Lopes et al. (2020a, 2020b) (Scales A and C), scores or latent variables were calculated using a factor analysis procedure with a reducing a set of variables to a single fixed factor (score or latent variable).

Factor analysis is a technique that represents the variables in a data set (y_1, y_2, \dots, y_p) as linearly related to random and unobservable variables called factors (f_1, f_2, \dots, f_m , where $m < p$). The factors are representative of the latent variables underlying the original variables. The purpose of factor analysis is to reduce the original variables by a smaller number of factors that allow for easier interpretation (Greene 2020).

The following main latent variables or scores were obtained for each of the samples (Tables 2 and 3):

- Score 1—Entrepreneurial intention: $A04 + A06 + A09_Rev + A13 + A17 + A19_Rev$;
- Score 2—Attitude towards behavior: $A02_Rev + A10 + A12_Rev + A15 + A18$;
- Score 3—Perceived behavioral control: $A01 + A05_Rev + A07 + A14 + A16_Rev + A20$;
- Score 4—Subjective norms: $A03 + A08 + A11$;
- Score 5—Next assessment: $C1 + C4 + C7$;
- Score 6—Social assessment: $C2 + C3_Rev + C5_Rev + C6 + C8_Rev$.

Table 3. Descriptive statistics of the scores obtained in sample 1.

Sample 1	Entrepreneurial Intention	Attitude towards Behavior	Perceived Behavioral Control	Subjective Norms	Next Assessment	Social Assessment
Median	−0.0105	0.1143	0.0288	0.1435	0.1638	0.0217
Deviation error	0.9576	0.9406	0.9218	0.9109	0.9239	0.8639
Minimum	−1.8950	−2.5459	−2.5694	−3.153	−1.7750	−2.6607
Maximum	1.8808	1.3479	2.0507	1.165	2.4464	1.8209

The attitude towards behavior, perceived behavioral control, and subjective norms variables correspond to motivational factors. The next assessment and social assessment variables correspond to environmental factors.

After obtaining these scores or latent variables, a confirmatory factor analysis (CFA) was performed using a CFA Analysis of Moment Structure (AMOS) in SPSS 5.0. to assess the consistency and reliability of the variables obtained and also the good fit to data of the models obtained for each sample (model 1—before COVID-19 and model 2—during COVID-19). The CFA results are described in Tables 4 and 5. Finally, based on the latent variables or scores obtained for each of the samples and to assess the entrepreneurial intention of the respondents, two models (corresponding to samples 1 and 2) of multiple linear regression were estimated using the ordinary least squares method (OLS) with the dependent variable being Score 1 (entrepreneurial intention) and the independent variables being the remaining scores (2 to 6) (Tables 6 and 7). For the application of the multiple linear regression model, it was verified that the following assumptions were fulfilled: (1) the errors are random variables with zero average; (2) the errors are random variables with constant variance (σ^2)—hypothesis of homoscedasticity; (3) the random variables are independent; (4) the explanatory variables are not correlated—hypothesis of absence of multicollinearity between the explanatory variables; and (5) the errors follow a normal distribution, $E_i \sim N(0, \sigma^2)$, essential to perform the hypothesis testing.

Table 4. Descriptive statistics of the scores obtained in sample 2.

Sample 2	Entrepreneurial Intention	Attitude towards Behavior	Perceived Behavioral Control	Subjective Norms	Next Assessment	Social Assessment
Median	−0.0310	0.1897	0.0487	0.2040	0.0368	0.1006
Deviation error	0.95191	0.9372	0.8903	0.9213	0.8517	0.9994
Minimum	−2.4635	−3.1304	−2.7299	−3.5614	−2.4799	−2.8411
Maximum	1.6349	1.1307	2.0684	0.9329	1.8093	1.5721

Table 5. Measures of the fit index for CFA.

	Model 1	Model 2
CMIN/df	2.191	2.783
Cronbach's Alpha	0.777	0.764
NFI	0.983	0.957
RFI	0.957	0.958
CFI	0.982	0.972
IFI	0.951	0.972
TLI	0.953	0.953
RMSEA	0.066	0.067
SRMR	0.072	0.073

Table 6. Measures of reliability and validity of each of the scores.

	Cronbach's Alpha		Composite Reliability		Average Variance Extracted (AVE)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Attitude towards behavior	0.798	0.762	0.882	0.864	0.714	0.680
Entrepreneurial intention	0.725	0.713	0.815	0.792	0.709	0.676
Next assessment	0.809	0.803	0.886	0.879	0.722	0.708
Perceived behavioral	0.805	0.749	0.872	0.840	0.632	0.570
Social assessment	0.747	0.769	0.657	0.698	0.590	0.538
Subjective norms	0.780	0.786	0.869	0.875	0.689	0.701

Table 7. Model summary.

Models	R	R Square	Adjusted R2	SE of the Estimate
Model 1	0.868 ^a	0.753	0.751	0.4987
Model 2	0.849 ^a	0.720	0.717	0.5315

^a Predictors: (Constant), Attitude towards behavior, Perceived behavioral control, Subjective norms, Next assessment, Social assessment.

4. Results Presentation and Discussion

Six scores were extracted for each of the samples (sample 1—before COVID-19 and sample 2—during COVID-19) as previously mentioned, where Score 1 relates to entrepreneurial intention, Score 2 to attitude towards behavior, Score 3 to perceived behavioral control, Score 4 to subjective norms, Score 5 to next assessment and Score 6 to social assessment. The statistics are described in Tables 3 and 4.

The results of the CFA performed on each of the models are presented in Table 5. The minimum discrepancy per degree of freedom (CMIN/DF) is 2.191 in model 1 and 2.773 in model 2, according to Kline (1998), where a CMIN/DF <3 indicates an acceptable fit between the hypothetical model and the sample data, as found in both models. Cronbach's alpha value is higher than the reference value of 0.70 in both models (model 1: 0.777 and model 2: 0.764) and the normed fit index (NFI), relative fit index (RFI), comparative fit index (CFI), incremental fit index (IFI), and Tucker–Lewis index (TLI) are greater than 0.95 and therefore, according to Hu and Bentler (1999), the model has a good fit to data. The root mean square error of approximation (RMSEA) was also obtained, and the closer to zero (<0.08 or <0.05), according to Bryne (2016), the better the models' good fit. In model 1, the RMSEA is 0.066 and in model 2 it is 0.067, thus these values are acceptable. Finally, the standardized root mean square residual (SRMR), which must be less than 0.08, was analyzed, as is the case in our models (model 1: 0.072 and model 2: 0.073). In this way, we conclude that, models 1 and 2 have a good fit to data.

Table 6 contains the measures of reliability and validity of each of the scores in each of the models. We conclude that both models are “satisfactory to good” in terms of internal consistency and reliability because the composite reliability and Cronbach's Alpha values for each latent variable or score must, according to Hair et al. (2019), be greater than 0.70 and the Average Variance Extracted (AVE) must be greater than 0.50, as verified in our two models.

From the main variables extracted, the following two models were estimated using the multiple linear regression method: (1) model 1 for sample 1—before COVID-19 and (2) model 2 for sample 2—during COVID-19. A multiple linear regression using the Ordinary Least Squares (OLS) method was conducted with the objective of assessing the main drivers of the respondents' entrepreneurial intentions. The results demonstrate the relationship between entrepreneurial values and intentions.

The dependent variable used was the entrepreneurial intention and the independent variables were the remaining calculated main variables extracted. Tables 7 and 8 describe the results obtained in the regressions.

Table 8. Coefficients.

Models		Nonstandard Coefficients		Standard Coefficients	t	Sig.
		β	Std Error	Beta		
Model 1	(Constant)	6.752×10^{-17}	0.020		0.000	1.000
	Attitude towards Behavior	0.551	0.026	0.551	21.055	0.000
	Perceived Behavioral Control	0.379	0.027	0.379	13.818	0.000
	Subjective Norms	−0.030	0.023	−0.030	−1.278	0.202
	Next Assessment	0.106	0.022	0.106	4.745	0.000
	Social Assessment	−0.042	0.021	−0.042	−2.000	0.046
Model 2	(Constant)	$−1.425 \times 10^{-16}$	0.023		0.000	1.000
	Attitude towards Behavior	0.590	0.029	0.590	20.066	0.000
	Perceived Behavioral Control	0.339	0.029	0.339	11.597	0.000
	Subjective Norms	0.013	0.026	0.013	0.497	0.620
	Next Assessment	0.025	0.025	0.025	0.983	0.326
	Social Assessment	0.025	0.024	0.025	1.017	0.309

Note: Dependent Variable: Entrepreneurial intention.

The application of a linear regression verified the assumptions of normality demonstrated both by the normal probability plots of the residuals and by the Kolmogorov–Smirnov test.

Considering $p < 0.05$, in model 1 (before COVID-19) all variables are significant except for the subjective norms variable (H3A is rejected). The variables attitude towards behavior, perceived behavioral control, and next assessment have a positive impact on entrepreneurial intent (H1A, H2A, and H5A are confirmed), while the social assessment variable has a negative impact (rejection), if H4A, that is, the higher the attitude towards behavior, the perceived behavior control, and the next assessment, the greater the entrepreneurial intention.

Thus, it is possible to perceive that, in a context of social and economic normality, without the disturbances caused by the pandemic context, respondents consider that, within the motivational dimension, only subjective norms do not have a positive impact on entrepreneurial intention. This means that the respondents tend not to consider the social pressure that can be exerted by the people who are closest to them, such as family, friends, or other important people in their life, in the decision to undertake entrepreneurship. Regardless of the approval or not and the social pressure that may result from it for an individual, this is not a motivational force that inhibits an entrepreneur in their action, which goes against the considerations (Ruiz-Rosa et al. 2020; Tiwari et al. 2017; Farrukh et al. 2018) that point towards a positive relationship between this social pressure and the entrepreneurial intention.

Concerning the environmental dimension, the results obtained indicate that social assessment has a negative impact on entrepreneurial intentions, which tells us that the values of specific groups or societies that contribute to the development of certain skills and personality traits of an individual entrepreneur, will not influence the way individuals view entrepreneurship. These findings are contrary to the studies conducted by Liñán et al. (2011), Karimi et al. (2016), and Thomas and Mueller (2000), which corroborates a positive influence relationship.

On the other hand, from the results of this research, we perceive that there is a positive influence of attitude towards behavior and perceived behavioral control in the motivational dimension, and the next assessment in the environmental dimension. From the entrepreneurial intention, we can comprehend that the attractiveness, easiness, or difficulty that an individual feels about becoming an entrepreneur and the influence of specific groups or societies favorably influences the relationship under study.

While the two initial potential influences studied seem to be positively influential in the entrepreneurial intention and motivational dimension, they found correspondence in the studies conducted by Ajzen (1991), Liñán et al. (2011), Fayolle et al. (2014), Martínez-González et al. (2019), and Ruiz-Rosa et al. (2020). The next assessment was also identified as positively influencing the environmental dimension, which confirms the studies of Liñán et al. (2011) and Thomas and Mueller (2000).

In model 2 (during COVID-19), only the attitude towards behavior and perceived behavior control are significant and also have a positive impact on entrepreneurial intent (H1B and H2B confirmed). Since, in model 1, the subjective norms variable was no longer significant to explain the entrepreneurial intention, in model 2, the next assessment and social assessment are also added as non-significant variables (excluding H3B, H4B, and H5B). We conclude that the independent variables attitude towards behavior and perceived behavioral control are, in both samples, very significant to explain entrepreneurial intention.

Thus, it is possible to perceive that in environments of instability and economic and social uncertainty, characteristic of the pandemic context, respondents consider that, within the motivational dimension, the relationship of positive and negative influences remains concerning the previously analyzed context. This means that, in the motivational dimension, the respondents in the present study recognize a positive influence of the attitude towards behavior and perceived behavioral control, leaving out subjective norms, that had already occurred in the context before the pandemic and that confirms the contributions of

Fayolle et al. (2014), Liñán et al. (2011), Martínez-González et al. (2019), Ruiz-Rosa et al. (2020), Krueger et al. (2000), Ruiz-Rosa et al. (2020), and Smith and Woodworth (2012) regarding the attitude towards behavior and perceived behavioral control vis-à-vis the entrepreneurial intention. However, there is no correspondence regarding the subjective norms in the contributions of Liñán et al. (2011), and Thomas and Mueller (2000).

In the environmental dimension, the pandemic context presents changes in the influence of the variables under study when compared to what had occurred before the pandemic. In this context, neither the next assessment nor the social assessment is found to have a positive influence on entrepreneurial intention, demonstrating that environmental factors no longer play an influential role in the configuration of these intentions, as advocated by Bandura et al. (1999), and Thomas and Mueller (2000).

In general terms, by comparing the models estimated before and during the pandemic, we can conclude that, during the pandemic, the main latent variables, next assessment and social assessment, are no longer explanatory of entrepreneurial intention (before the pandemic they were significant). Having a very significant impact in explaining entrepreneurial intent, the main latent variables were the attitude towards behavior and perceived behavior control. Table 9 summarizes the results of the hypothesis formulation.

Table 9. Summary of Hypothesis Tests.

Hypothesis	Results	
	Model 1	Model 2
H1A. Attitude towards behavior has a positive impact before the pandemic on entrepreneurial intentions.	Supported	NA
H1B. Attitude towards behavior has a positive impact during the pandemic on entrepreneurial intentions.	NA	Supported
H2A. Perceived behavioral control has a positive impact before the pandemic on entrepreneurial intentions.	Supported	NA
H2B. Perceived behavioral control has a positive impact during the pandemic on entrepreneurial intentions.	NA	Supported
H3A. Subjective norms have a positive impact before the pandemic on entrepreneurial intentions.	Not Supported	NA
H3B. Subjective norms have a positive impact during the pandemic on entrepreneurial intentions.	NA	Not Supported
H4A. Social assessment has a positive impact before the pandemic on entrepreneurial intentions.	Not Supported	NA
H4B. Social assessment has a positive impact during the pandemic on entrepreneurial intentions.	NA	Not Supported
H5A. The next assessment has a positive impact before the pandemic on entrepreneurial intentions.	Supported	NA
H5B. The next assessment has a positive impact during the pandemic on entrepreneurial intentions.	NA	Not Supported

Supported: the hypothesis is accepted; Not Supported: the hypothesis is rejected; NA: not applicable in the model.

5. Conclusions

The present research's main objective was to study the determinants of entrepreneurial intention in academia and compare the outcome from two different moments, before and during the COVID-19 pandemic. In this sense, it was possible to ascertain that, given the motivational dimension, attitude towards behavior and perceived behavioral control are having a positive impact on entrepreneurial intentions during the pandemic and that subjective norms have a negative impact on entrepreneurial intentions. This relationship of influences is unchanged, whether we analyze the period before or during the pandemic. Regarding the environmental dimension, both variables under analysis are having a negative impact on entrepreneurial intention during the pandemic period, which corresponds to an aggravation or loss of positive influences when compared to the context before the pandemic, where the next assessment played a positive impact on entrepreneurial intentions.

These findings are important to strengthen the literature on entrepreneurial intentions, which is abundant in terms of studies carried out in times of social and economic "normality", but scarce in periods of instability such as pandemic contexts; therefore, this research contributes to the theory of entrepreneurial intentions.

On the practical side, the contributions from this research serve to reinforce the idea that the performance of the various agents with power to intervene in society (private and public agents, higher education institutions, business incubators, or entrepreneurship promotion agencies), should focus their attention mainly on the creation of favorable environmental contexts to promote entrepreneurial intentions, as the main indicators that translate a more significant retraction of entrepreneurial intention are found in contexts of instability, uncertainty, and insecurity, such as those provoked by the pandemic context. As such, policy makers may create new incentives, for example by lowering company creation rates, or even exempting new companies from some taxes until the COVID-19 pandemic is overcome. Policy makers should also create protocols to be activated during a pandemic to minimize losses, making the economy more dynamic. By directing attention to the possible actions to be taken by higher education institutions, it is possible to suggest the adaptation of their courses to new needs resulting from the pandemic, and even evaluate the possibility to introduce entrepreneurship in their curricular programs as a module centered on the challenges that arise to entrepreneurship in contexts analogous to that caused by the pandemic. In doing so, they can better prepare their students and help to increase entrepreneurial intent at this juncture.

This research is original, as far as the authors know, and it is the first research to study entrepreneurial intention in academia during the COVID-19 pandemic in the Portuguese context. Despite these considerations, it should be taken into account that the present research was performed in a specific context, and it is necessary to reinforce the conclusions now presented in future studies performed in other geographical, demographic, social, and economic contexts, or even amongst other types of samples. It is also suggested that additional studies be carried out to contemplate the possibility of including other variables that may influence entrepreneurial intentions, as well as the realization of longitudinal studies, that can ascertain trends and the evolution of motivational and environmental influences on the entrepreneurial attitude.

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